



FW
PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: Georgios B. Giannakis; Confirmation No. 1066
Liuqing Yang
Serial No.: 10/796,567
Filed: March 8, 2004 Customer No.: 28863
Examiner: Unknown
Group Art Unit: 2631
Docket No.: 1008-015US01
Title: TIMING SYNCHRONIZATION USING DIRTY TEMPLATES IN ULTRA WIDEBAND (UWB) COMMUNICATIONS

CERTIFICATE UNDER 37 CFR 1.8: I hereby certify that this correspondence is being deposited with the United States Post Service, as First Class Mail, in an envelope addressed to: Commissioner for Patents, Alexandria, VA 22313-1450 on September 24, 2004.

By: Beth M. Lindblom
Name: Beth M. Lindblom

INFORMATION DISCLOSURE STATEMENT

Commissioner for Patents
Alexandria, VA 22313-1450

Dear Sir:

Applicant submits the references listed on the attached form PTO-1449. This statement is being filed, to the best of Applicant's knowledge, before the receipt of a first Office Action on the merits.

Applicant has enclosed copies of each article cited and each foreign document cited.

Respectfully submitted,

Date: September 24, 2004

Shumaker & Sieffert, P.A.
8425 Seasons Parkway, Suite 105
St. Paul, Minnesota 55125
Phone: (651) 735-1100
Fax: (651) 735-1102

Kent J. Sieffert

By: Kent J. Sieffert
Reg. No.: 41,312

O I P E
SEP 27 2004
PATENT & TRADEMARK OFFICE
INFORMATION DISCLOSURE STATEMENT
IN AN APPLICATION
(Use several sheets if necessary)

Form 1449*	Docket Number: 1008-015US01	Application Number: 10/796,567
	Applicant: Georgios B. Giannakis; Liqing Yang	
	Filing Date: March 8, 2004	Group Art Unit: 2631
	Examiner Name: Unknown	

U.S. PATENT DOCUMENTS

Examiner Initial	Document Number	Issue/Document Publication Date	Name	Filing Date If Appropriate

FOREIGN PATENT DOCUMENTS

Examiner Initial	Document Number	Publication Date	Country	Translation	
				Yes	No

OTHER DOCUMENTS (Including Authors, Title of Item, Page(s), Vol/Issue No., Publisher, Place of Publication)

	Z. Wang et al., "Block Precoding for MUI/ISI-Resilient Generalized Multicarrier CDMA with Multirate Capabilities," IEEE Transactions on Communications, Vol. 49, no. 11, pp. 2016-2027, November 2001.
	F. Ramirez-Mireles et al., "System Performance Analysis of Impulse Radio Modulation," Proceedings Radio Wireless Conference, Colorado Springs, CO, pp. 67-70, August 1998.
	M. Win et al., "Ultra-Wide Bandwidth Time-Hopping Spread-Spectrum Impulse Radio for Wireless Multiple-Access Communications," IEEE Transactions on Communications, Vol. 48, No. 4, pp. 679-691, April 2000.
	A. Saleh et al., "A Statistical Model for Indoor Multipath Propagation," IEEE Journal on Selected Areas in Communications, Vol. SAC-5, No. 2, pp. 128-137, February, 1987.
	B. Hassibi et al., "On the Expected Complexity of Sphere Decoding," Proceedings of the Asilomar Conference on Signals, Systems and Computers, Vol. 2, pp. 1051-1055, 2001.
	B. Hochwald et al., "Unitary Space-Time Modulation for Multiple-Antenna Communications in Rayleigh Flat Fading," IEEE Transactions on Information Theory, Vol. 46, No. 2, pp. 543-564, March 2000.
	C. Le Martret et al., "All-Digital PPM Impulse Radio for Multiple-Access Through Frequency-Selective Multipath," Procedures of GLOBECOM, Vol. 1, pp. 22-26, San Francisco, CA, November 17 – December 1, 2000.
	C.J. Le Martret et al., "All-Digital Impulse Radio with Multiuser Detection for Wireless Cellular Systems," IEEE Transactions on Communications, Vol. 50, No. 9, pp. 1440-1450, September 2002.

	C.J. Le Martret et al., "All-Digital PAM Impulse Radio for Multiple-Access Through Frequency-Selective Multipath," Proc. of Sensor Array and Multichannel Signal Processing Workshop, Boston, pp. 77-81, March 2000.
	D. Cassioli et al., "Performance of Low-Complexity Rake Reception in a Realistic UWB Channel," 2002 IEEE International Conference on Communications, pp. 763-767, New York City, N.Y., April 28 – May 2, 2002.
	E. Homier et al., "Rapid Acquisition of Ultra-Wideband Signals in the Dense Multipath Channel," G.E Research Development Center, Technical Information Series, pp. 105-109, January, 2002.
	F. Gini et al., "Frequency Offset and Symbol Timing Recovery in Flat-Fading Channels: A Cyclostationary Approach," IEEE Transactions On Communications, Vol. 46, No. 3, pp. 400-411, March 1998.
	F. Ramirez-Mireles et al., "Multiple Access With Time-Hopping and Block Waveform PPM Modulation," 1998 IEEE International Conference on Communications, Vol. 2 of 3, pp. 775-779, Atlanta, Georgia, June 1998.
	G. Leus et al., "MUI-Free Receiver for a Synchronous DS-CDMA System Based on Block Spreading in the Presence of Frequency-Selective Fading," IEEE Transactions on Signal Processing, Vol. 48, No. 11, pp. 3175-3188, November 2000.
	G.B. Giannakis et al., "AMOUR-Generalized Multicarrier Transceivers for Blind CDMA Regardless of Multipath," IEEE Transactions on Communications, Vol. 48, No. 12, pp. 2064-2076, December 2000.
	H. Lee et al., "Multipath Characteristics of Impulse Radio Channels," 2000 IEEE 51 st Vehicular Technology Conference Proceedings, Tokyo, Japan, pp. 2487-2491, May 15-18, 2000.
	J.D. Choi et al., "Performance of Autocorrelation Receivers for Ultra-Wideband Communications with PPM in Multipath Channels," 2002 IEEE Conference on Ultra Wideband Systems and Technologies, pp. 213-217, Baltimore, MD, USA, May 2002.
	J.D. Choi et al., "Performance of Ultra-Wideband Communications With Suboptimal Receivers in Multipath Channels," IEEE Journal on Selected Areas in Communications, Vol. 20, No. 9, pp. 1754-1766, December 2002.
	J.K. Cavers, "An Analysis of Pilot Symbol Assisted Modulation for Rayleigh Fading Channels," IEEE Transactions On Vehicular Technology, Vol. 40, No. 4, pp. 686-693, November 1991.
	J.R. Foerster, "The Effects of Multipath Interference on the Performance of UWB Systems in an Indoor Wireless Channel," IEEE VTS 53 rd Vehicular Technology Conference, Vol. 2, pp. 1176-1180, Rhodes, Greece, May 6-9, 2001.

	J.R. Foerster et al., "Ultra-Wideband Technology for Short- or Medium-Range Wireless Communications," Ultra-Wideband Technology for Short- or Medium-Range Wireless Communications, pp. 1-11.
	K.Siwiak et al., "Ultra-Wide Band Radio: The Emergence of An Important New Technology," IEEE VTS 53 rd Vehicular Technology Conference, Vol. 2, pp. 1169-1172, Rhodes, Greece, May 6-9, 2001.
	L. Yang et al., "Multistage Block-Spreading for Impulse Radio Multiple Access Through ISI Channels," IEEE Journal on Selected Areas in Communications, Vol. 20, No. 9, pp. 1767-1777, December 2002.
	L. Yang et al., "Space-Time Coding for Impulse Radio," 2002 IEEE Conference on Ultra Wideband Systems and Technologies, pp. 235-239, Baltimore, MN, May 20-23, 2002.
	L. Yang et al., "Impulse Radio Muliple Access Through ISI Channels With Multi-Stage Block-Spreading" 2002 IEEE Conference on Ultra Wideband Systems and Technologies, pp. 277-281, Baltimore, MD, May 21-23, 2002.
	L. Yang et al., "Optimal Pilot Waveform Assisted Modulation for Ultrawideband Communications," IEEE Transactions on Wireless Communications, Vol. 3, No. 4, pp. 1236-1349, July 2004.
	L. Yang et al., "Non-Data Aided Timing Acquisition of Ultra-Wideband Transmissions Using Cyclostationarity," 2003 IEEE International Conference on Acoustics, Speech and Signal Processing, Hong Kong, Vol. IV of VI, April 6-10, 2003.
	M.Z. Win et al., "Impulse Radio: How it Works," IEEE Communications Letters, Vol. 2, No. 2, pp. 36-38, February 1998.
	M.L. Welborn, "System Considerations for Ultra-Wideband Wireless Networks," 2001 IEEE Radio and Wireless Conference, pp. 5-8, Boston, MA, August 19-22, 2001.
	M.Z. Win et al., "On the Energy Capture of Ultrawide Bandwidth Signals in Dense Multipath Environments," IEEE Communications Letters, Vol. 2, No. 9, pp. 245-247, September 1998.
	M.Z. Win et al., "Ultra-Wide Bandwidth Time-Hopping Spread-Spectrum Impulse Radio for Wireless Multiple-Access Communications," IEEE Transactions on Communications, Vol. 48, No. 4, pp. 679-691, April 2000.
	M.Z. Win et al., "Virtual Path Analysis of Selective Rake Receiver in Dense Multipath Channels," IEEE Communications Letters, Vol. 3, No. 11, pp. 308-310, November 1999.
	M.Z. Win et al., "ATM-Based TH-SSMA Network for Multimedia PCS," IEEE Journal on Selected Areas in Communications, Vol. 17, No. 5, pp. 824-836, May 1999.

	O. Wintzell et al., "On the Capacity of a Pulse-Position-Hopped CDMA System," IEEE Transactions On Information Theory, Vol. 47, No. 6, pp. 2639-2644, September 2001.
	P. Withington, II et al., "An Impulse Radio Communications System," Ultra-Wideband, Short-Pulse Electromagnetics, Brooklyn, NY, pp. 113-12, October 1992.
	R. Fleming et al., "Rapid Acquisition for Ultra-Wideband Localizers," 2002 IEEE Conference on Ultra Wideband Systems and Technologies, Baltimore, MD, pp. 245-249, May 21-21, 2002.
	R.A. Scholtz, "Multiple Access with Time-Hopping Impulse Modulation," Communications On The Move, Boston, MA, USA, pp. 447-450, October 1993.
	R.T. Hoctor et al., "An Overview of Delay-Hopped, Transmitted-Reference RF Communications," GE Research and Development Center, Technical Information Series, pp. 1-29, January 2002.
	S. Adireddy et al., "Optimal Placement of Training for Frequency-Selective Block-Fading Channels," IEEE Transactions On Information Theory, Vol. 48, No. 8, pp. 2338-2353, August 2002.
	S. Ohno et al., "Optimal Training and Redundant Precoding for Block Transmissions with Application to Wireless OFDM," IEEE Transactions on Communications, Vol. 50, No. 12, December 2002.
	S. Zhou et al., "Space-Time Coding with Maximum Diversity Gains Over Frequency-Selective Fading Channels," IEEE Signal Processing Letters, Vol. 8, No. 10, pp. 269-272, October 2001.
	S. Zhou et al., "Chip-Interleaved Block-Spread Code Division Multiple Access," IEEE Transactions on Communications, Vol. 50, No. 2, pp. 235-248, February 2002.
	S.M. Alamouti, "A Simple Transmit Diversity Technique for Wireless Communications," IEEE Journal On Selected Areas In Communications, Vol. 16, No. 8, pp. 1451-1458, October 2000.
	S.S. Kolenchery et al., "A Novel Impulse Radio Network for Tactical Wireless Communications," Procedures Milcom Conference, Bedford, MA, October 1998.
	S.S. Kolenchery et al., "Performance of Local Power Control in Peer-to-Peer Impulse Radio Networks With Bursty Traffic," IEEE Global Telecommunications Conference, Vol 2 of 3, Phoenix, AZ, USA, pp. 910-916, November 3-8, 1997.
	U. Fincke et al., "Improved Methods For Calculating Vectors of Short Length in a Lattice, Including a Complexity Analysis," Mathematics of Computation, Vol. 44, No. 170, pp. 463-471, April 1985.

	V. Lottici et al., "Channel Estimation for Ultra-Wideband Communications," IEEE Journal on Selected Areas in Communications, Vol. 20, No. 9, pp. 1638-1645, December 2002.
	V. Tarokh et al., "Space-Time Block Codes From Orthogonal Designs," IEEE Transactions on Information Theory, Vol. 45, No. 5, pp. 1456-1467, July 1999.
	V. Tarokh et al., "Space-Time Codes for High Data Rate Wireless Communication: Performance Criterion and Code Construction," IEEE Transactions on Information Theory, Vol. 44, No. 2, pp. 744-765, March 1998.
	W.M. Lovelace et al., "The Effects of Timing Jitter on the Performance of Impulse Radio," 2002 IEEE Conference on Ultra Wideband Systems and Technologies, pp. 251-254, Baltimore, MD, May 21-23, 2002.
	X. Chen et al., "Monocycle Shapes for Ultra Wideband System," 2002 IEEE International Symposium on Circuits and Systems, Vol. I of V, pp. I-597 – I-600, Scottsdale, AZ, May 25-29, 2002.
	Z. Tian et al., "Symbol Timing Estimation in Ultra-Wideband Communications," Proceceries of 36 th Asilomar Conference on Signals, Systems, and Computers, Pacific Grove, CA, November 3-6, 2002.
	Z. Wang et al., "Wireless Multicarrier Communications: Where Fourier Meets Shannon," IEEE Signal Processing Magazine, Vol. 47, No. 3, pp. 1-21, May, 2000.
	Z. Wang et al., "Vandermonde-Lagrange Mutually Orthogonal Flexible Transceivers for Blind CDMA in Unknown Multipath," Procedures of Workshop on Signal Processing Advances in Wireless Communication, Annapolis, MD, pp. 42-45, May 9-12, 1999.
EXAMINER	Date Considered

*Examiner: Initial if reference considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

Based on Form PTO-FB-A820
(Also form PTO-1449)

Patent and Trademark Office, U.S. Department of Commerce